Course Unit Descriptor

Study Programme: Civil Engineering

Course Unit Title: Energy efficient materials and diagnostic of building thermotechnical performances

Course Unit Code: EEA05

Name of Lecturer(s): Malešev Mirjana, Bulatović Vesna, Lukić Ivan

Type and Level of Studies: master

Course Status (compulsory/elective): elective

Semester (winter/ summer): summer

Language of instruction: english

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 5

Prerequisites: none

Course Aims:.

Acquiring knowledge about energy efficient materials, their thermo-technical properties and possibilities and limitations in the application. Understanding the correlation between the properties of energy-efficient materials for the thermal envelope of the building and the design indoor and outdoor conditions. Qualification to apply and analyze the results of field and laboratory testing of energy performance of buildings.

Learning Outcomes:

Possession of specialized academic knowledge in the field of energy efficient materials and diagnostics of thermo-technical performance of buildings. Qualification to properly selection of the thermal building envelope composition based on the analysis of physical processes (heat conductivity, heat capacity, water vapor diffusion) and properties of selected thermal insulation materials. Solving of complex tasks in order to determine the energy performance of built buildings using equipment for diagnostics of thermo-technical properties of buildings.

Syllabus.

The basic physical-mechanical properties of building materials, which are of importance for thermo-technical performance of buildings, their functionality and durability. Classification of thermal insulation materials from the aspect of the raw material for their production, thermal insulation properties and the place of application. Thermal insulation materials of mineral origin (natural materials, rock wool, glass wool, cellular glass, glass foam). Artificial thermal insulation materials of organic origin (expanded polystyrene, extruded expanded polystyrene, polyurethane). Natural thermal insulation materials of organic origin (cane, wood wool, cork, wooden pellet, hemp, linen, coconut fibres, cellulose, textile, cotton). Thermal insulation concrete and mortars. Straw bale houses. Modern elements for masonry walls. Methods and laboratory and field equipment for diagnostics of thermo-technical performances of buildings.

Required Reading:

Relevant literature in English, tbd

Weekly Contact Hours:2	**Lectures: 2**	**Practical work: 2**

Teaching Methods:

Lectures, Auditory and Laboratory Exercises and Consultations. Elaboration of a seminar work is obligatory. Student's effort and progress during lectures and exercises are evaluated as well as elaboration and defense of seminar work. The exam is taken orally.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Attendance			
Computer exercises			
Tests (4x)			